

## ***Interactive comment on “In-situ measurements of oxygen, carbon monoxide and greenhouse gases from Ochsenkopf tall tower in Germany” by R. L. Thompson et al.***

**Anonymous Referee #2**

Received and published: 7 July 2009

The manuscript addresses questions within the scope of AMT and the special issue on tall tower measurements. The instrumentation of the new tall tower atmospheric measurement station Ochsenkopf for greenhouse gases and related tracers is comprehensively presented in a well-structured and clear way, the latter concerning both the content and the language. Effects of atmospheric transport phenomena close to this new mountain station, as well as the usage of the data in larger-scale greenhouse gas (modelling) studies are shown in examples.

I can recommend the publication of this manuscript with only minor modifications.

General remark: There is only little that I note should be improved in this manuscript,

C366

and even less I could add to referee #1 's comments. So most of my remarks stay on a very technical level. The comments and remarks as given by referee #1 do have my support, even without repeating them.

Remarks with regard to the contents: Abstract: As a main point of the paper is the measurement station and techniques, I would rather emphasize the analytical achievements and e.g. the flask-in situ comparison in the abstract than the somehow questionable 'multi-annual trends' of the valuable but short time-series.

1249/1: (how) are you able 'to monitor the changes in their natural sources and sinks' apart from anthropogenic sources?

1249/11: in general, coastal stations do sample influences from marine as well as continental areas. What do you mean by "only small spatial variability"?

1267/24ff: wouldn't you expect an increase of the mixing ratios at the lowest height – and thus the development of a vertical gradient - under stable conditions even from constant fluxes?

1270/13: please mark the Ruhrgebiet area in the map, I'm not yet convinced that it coincides with the area of strongest influence, but rather falls into areas with moderate influence and no influence.

1271/16: does 'localised' mean outside the footprint? Or are the localised sources somehow (statistically?) spread within the footprint?

Fig.3: as mentioned by referee#1 there might be a bias through the rectifier effect. To be included into the text.

Specific (technical) comments, remarks and suggestions, in order to make the text even clearer:

1248/2: include the time of the presented measurements from... until...

1248/3 and further occurrences: repeat the unit of height, mixing ratio etc. after each

C367

number.

1284/6: include ...analysed for 'the mixing ratios of' the same...

1248/17: replace 'change' by 'difference'

1248/25: give a full citation to the Kyoto protocol.

1249/5: please include a reference for the remote sensing observations you mention, and name the gases

1249/29: what is 'high' in this context?

1249/23-25: the four citations are missing in the reference list.

1251/21: include Ochsenkopf 'station' and MPI-BGC 'laboratory'.

1251/29: include 'from... until...'

1252/ 2.1: mention in the beginning the number of tubings per height.

1253/12, 15, 24: mention the diaphragm (and other) material.

1254/3: 'second trap'; why is a second trap necessary?

1254/9: how do you know that no water is condensing inside the pump?

1255/2 and other occurrences: just to be sure, are they 3-way-valves? Frequently 3-port 2way-valves are called 3-way valves.

1256/4: it is a strong word to say 'we avoided any junction', if one is mentioned in the next sentence.

1257/25: remove 'approximately daily, to be specific,'

1258/ 2.3: refer to fig 2

1258/24: 'zero air' is zero in what component?

C368

1263/26-28: you missed one parenthesis, make it a normal sentence in the text.

1265/8: should read 'principal'

1267/12: figure 5 shows 'as a typical/ extreme/ ... example' ...

1270/7: include brackets: ppb/( $\mu\text{molm}^{-2}\text{s}^{-1}$ )

1272/5: replace 'and' by 'which'

1272/7: the area should be even larger, as estimated from the coloured area in fig. 10

References Jordan et al. and Rothe et al., are published in 2005. Please give the full citation of WMO TD 1275 (eds. Worthy and Huang)

Kozlova et al., 2008b: change to AMT citation.

Fig. 1: there will probably be an overview paper in the special issue, but as you mention the other towers you might want to include them into the map.

End of referee report.

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Interactive comment on Atmos. Meas. Tech. Discuss., 2, 1247, 2009.

C369